Multimillion Dollar Construction Project Completed in Glenn's Icing Research Tunnel

Over the last year, the Glenn Research Center's Icing Research Tunnel (IRT) underwent a major $5.2 million rehabilitation project as part of the Construction of Facilities program. The scope of the project included redesign and replacement of the 55-yr-old heat exchanger, the addition of fan outlet guide vanes for flow conditioning downstream of the 25-ft-diameter fan, and redesign and replacement of the C and D corner-turning vanes. The purpose of the rehabilitation was to replace old portions of the infrastructure and to improve the aerodynamic flow quality in the tunnel.

Demolition of the IRT's original heat exchanger and turning vanes.

IRT's new 1650-ton heat exchanger.

After the construction phase was completed, the IRT facility engineers and technician staff successfully completed the Integrated Systems Testing. Next, a full calibration of the IRT's

aerothermodynamics and icing cloud characteristics was completed. Results of these calibrations indicate that the temperature uniformity of the tunnel has improved significantly with variation across the tunnel cross section minimized to ± 1 °F. Flow angularity and turbulence intensity in the test section and settling chamber also improved. The achievable velocity in the test section during icing tests increased because of a reduction in the pressure drop across the heat exchanger and in the frost buildup.

Newly installed "C" corner fiberglass turning vanes in the IRT.

Calibration tests were completed in July 2000, and the IRT's first research test program was successfully completed in early August. With the completion of the extensive facility modifications, the IRT is well positioned to support both NASA icing research programs and private industry customers well into the future.

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